

ginning, is increasing, and shall increase so long as vegetable and animal life covers the surface of the earth. This is not the case where vegetation ceases to cover the surface, and the sun and wind get direct access to the surface; any soil that may have been formed there soon disappears. In such situations, until vegetation has again spread itself, all the earthworms that could congregate there would only add to the decaying animal matter, as live they could not, there being no food for them in the absence of vegetation and other animal matter.

Bonnington, Midlothian

JAMES MELVIN

I INCLOSE an excerpt from NATURE of January 3 (p. 213), which I saw in one of our daily newspapers. The observation there made is correct as to the absence of earthworms in the region mentioned, but the reason assigned is, I think, incorrect. It is well known to settlers on virgin soils in this country that in the first tillage of the ground they will see no earthworms. This is equally the case whether they settle upon prairie land which has been swept annually by fires, or upon wood land which has been cleared for cultivation and which has never been burned over. Even in the natural meadows called "beaver meadows," which one will chance upon in an otherwise completely forest-covered region, one will at first find no sign of the earthworm. Some sluggish stream is dammed by a colony of beavers, and the land flooded is cleared of trees by them. Alluvial deposits accumulate, and when the beavers have been killed or driven away the dam is destroyed by freshets, and the little stream regains its former dimensions, while the flooded ground, drained naturally, becomes a meadow covered with wild grasses nourished by rich depths of soil. But, until settlement and tillage by man, there is no trace of earthworms even in these most favourable localities. At first they are found about the stableyard, then in portions of ground enriched by stable manure, garden or meadow, till at length they may be found in all soils, either those cultivated or those pastured by domesticated animals.

For years I have been accustomed to go to Mukoka, in the Canadian Dominion, for shooting and fishing. This section is a wooded wilderness with numerous lakes and streams. It is still Governmental wild land, and in part unsurveyed for settlement. The frontier settlers there tell me that until a place has been inhabited for five years it is useless to search for the earthworm.

H. F. WALKER

8, East Thirtieth Street, New York City, U.S.A.,

March 5

The Remarkable Sunsets

THE following extract from a letter written at Auspaki, province of Vitebsk, Russia, may be of interest:—

"February 26 (Old Style), March 9

"February has been the coldest and the pleasantest month this winter, particularly the latter part of it; frost from 5° to 12° Reaumur; bright sunshine. Now we have been able to see the roseate sunsets, which for at least three months have been hidden by clouds. We are, however, so accustomed to brilliant sunsets here, that we might not have remarked them if our attention had not been directed to them. Here, generally, when the sky is clear and the frost severe, the eastern horizon is a misty blue, above which is a rosy streak melting away into the clear blue above. But these latter sunsets have differed from that in a great measure. The west has often been blood-red, and the eastern horizon has been rosy, not so much in a streak but in patches, which have sometimes been visible over head. At the beginning of the month I was in Riga, and found the river open below bridge; indeed, the navigation has not been closed the whole winter. Snow there was none in Riga, and I saw them carting the most miserable ice for the ice-cellars; I think it was little more than six inches thick. We have been favoured here; we have retained our snow, and have had, and still have, good sledge roads. We filled the ice-cellar the day before yesterday, and the ice was more than a foot in thickness. . . ."

J. M. HAYWARD

Sidmouth, March 24

THOUGH we are no longer favoured with the gorgeous sunsets which marked the autumn and early winter, yet two phenomena are still frequently visible which seem referable to the same cause as those splendid displays.

The first is the unusual *white glow* in the western sky before

sunset which was an almost constant precursor of the brilliant and long-continued colouring of the past months. It was very marked on November 8, the occasion of the first remarkable sunset, and it is still to be seen on almost any fine evening before the sun sets, though it is no longer followed by the more striking phenomena.

The second is a decidedly unusual *pink tinge* occasionally visible for some ten to twenty degrees round the sun when shining in a somewhat hazy sky, the colour being brought out with great distinctness if light cumulus cloud happens to be passing across it. I first observed it about 1 p.m. on Sunday, March 2, and it was very marked last Thursday (20th) between 10 and 11 a.m., and again on Friday (21st) between 1 and 2 p.m., as well as on one or two other days which I have not specially noted.

May not both be due to the gradual subsidence to a lower level in our atmosphere of the particles which at a higher elevation caused the wonderful colouring of the past months?

Hampstead, March 24

B. W. S.

P.S.—Since first writing the above, I see in NATURE that it was from March 1 to 3 that the fall of dust was noticed at Killecraggan. Writing from the neighbourhood of London, it may be as well to say that the appearance is wholly different from any effect of London smoke (with which I have been familiar for nearly fifty years) both in colour and in being produced at a higher level than that of ordinary clouds.

"Curious Habit of a Brazilian Moth"

IN NATURE for May 17, 1883 (p. 55), appeared a letter entitled as above, by Mr. E. Dukinfield Jones, in which the author stated that he had observed a kind of moth in Brazil engaged in sucking up water in large quantity through its proboscis. I may say that this strange habit is not confined to *Panthera apardalaria*, as I have observed the same thing in two species of butterfly (*Papilio oriscabus*, B., and *Appias saba*, F.), and imagine that the phenomenon is by no means rare. These two butterflies are very common by the sides of streams and damp places on the Ankay plain in Madagascar.

One morning while sitting by the side of one of these streams I noticed the *Papilio*, which is an insect measuring about four inches from tip to tip of its wings, resting on the wet bank; and wishing to procure it as a specimen, I approached it as gently as possible, the creature being apparently so absorbed in what it was about as to be totally unconscious of my proximity to it. Noticing strange and unaccountable movements—sundry jerks and probings with its proboscis—I quietly sat down near it to watch it more closely. I observed that every second or two a drop of pure liquid was squirted (not exuded merely) from the tip of its abdomen. I picked up a leaf that was lying near, and inserted the edge of it between the insect's body and the ground so as to catch the liquid. Unfortunately I had no watch with me at the time, nor means of measuring liquids; but I reckoned that about thirty drops were emitted per minute. I held the leaf for about five minutes—as nearly so as I could reckon—and at the end of that time there was caught in it about a saltspoon full of what seemed to be pure water, without either taste or colour. After watching the butterfly for a time, I seized it by the wings between my thumb and fingers with the greatest ease, so utterly lost did it appear to be to what was going on near it.

In another spot I saw as many as sixteen of these large butterflies within the space of a square foot, all engaged in the same strange action. Some of them emitted the liquid more frequently and in greater quantity than others; and one of them squirted the liquid so as to drop fully a quarter or a third of an inch beyond the point on the ground perpendicular with the end of its body. It was at this spot that I saw the second of the butterflies alluded to also engaged in the same curious proceeding.

Antananarivo, Madagascar, January 3

R. BARON

Representation of Students

THE students in residence at Girton College are indirectly represented by the members elected by the "certificated students," but cannot themselves, whilst they are in the condition of undergraduates, elect a representative on the governing body.

The College Hall of Residence has advanced one step further in the same direction by offering direct representation to students *in residence*, and it is this new departure which was mentioned in NATURE (vol. xxix. p. 388).

Ever since the establishment of Girton College, students in residence have valued their prospective right to have a voice in the management more dearly than would generally be credited, and have held that Girton stood first among colleges for women partly because it conferred this dignity upon its students.

But the dignity conferred by the actual enjoyment of a privilege exceeds that conferred by a prospective right to the same privilege.

ANOTHER CERTIFICATED STUDENT
OF GIRTON COLLEGE

"Suicide" of Black Snakes

IN NATURE, March 13, p. 452, Mr. Edward Hardman, Government Geologist of Perth, West Australia, mentions an instance of the suicide, by its own venom, of a black snake. The snake had been wounded, and, the wounded part having been attacked by black ants, "it instantly turned short round and bit itself twice on the neck with seeming determination; in less than one minute it was dead." Mr. Hardman believed the death to be due to its own venom.

He records further instances, *which, though he had not witnessed himself*, had been related to him by those who had witnessed the facts.

I believe it to be a generally accepted opinion among thanatophidiologists that, from what is known of the virulent properties of snake-poison, though fatal to man and other living beings, it is innocuous in its effects to serpents of like nature. Sir Joseph Fayrer, a great authority upon this question, has said: "Strange to say—and this to me is one of its greatest mysteries—a snake cannot poison itself or one of its own species, scarcely its own congeners, and only slightly any other genus of venomous snake, but it kills innocent snakes quickly" (address on "The Nature of Snake-Poison," delivered at a meeting of the Medical Society of London, January 28).

The glands which secrete such venom draw their secretion from the blood; that blood, therefore, must have within itself, as part of itself, the elements which constitute its virulence, and cannot therefore be injuriously affected by a further introduction of these elements. Their presence in the blood gives to this vital fluid a power whereby an immunity is obtained, somewhat similar to that which vaccination and syphilisation give to human beings, and which the vaccination of the cultivated virus of anthrax, of rinderpest, of foot-and-mouth disease, gives to animals.

It may, however, happen that the climate of Australia has a special action producing effects different from those observed in India, and, if so, requiring close investigation and study.

The question becomes an interesting one, and, if philosophically prosecuted, may elicit facts which would give to this instance of venom envenoming itself a significance and an established position in the history of natural science.

JAMES DONNET

Unconscious Bias in Walking

THIRTY or more tests in walking, with closed eyes, on a nearly level lawn lightly covered with newly-fallen snow, gave the following results:—My natural gait, in which I step a half to three-quarters of an inch further with my right foot than with my left, always produced a sharp curve to the right. Whenever the step made by either foot was about three inches greater than that made by the other my course was substantially straight. A curve to the left always resulted when either foot stepped more than three inches further than the other. Unnatural toeing out of either foot did not change the result. My right arm is three-quarters of an inch longer than my left, but my legs are of equal length. Both limbs on my right side are stronger and more skilful than those on the left. When but a single action is required, it is my right arm or my right leg that prefers to perform it. When two actions are necessary, the right side chooses that requiring the greater skill, leaving to the left the plainer work, regardless of the power demanded by it. Thus, in mounting a horse, or leaping across a ditch in the ordinary manner, I spring from the left foot; yet if I am to land on the foot from which I start, I can hop higher and farther with my right leg. I can also lift a greater weight with it; and can lower myself to, and raise myself from, a kneeling position with the right leg alone—a feat impossible for me to perform with the left. In my case, at least, the division of labour is decided by skill, and not by strength. The facts, considered in connection with the further

observation that in walking the foot which for the time being supports the person does not rock into a pushing position until the other foot has completed its forward motion and is ready to drop to the ground, incline me to the opinion that walking is a reaching rather than a pushing process. Perhaps photography may help to decide this point.

J. E. SMITH

New York, March 10

Recent Weather in North America

THE ice-storm, as we call it, which we have lately experienced, seems to call for a permanent record. It began at about 4 p.m. on the 7th inst., and until 12 noon of the following day there was a constant drizzle or rain, the thermometer being a few degrees below the freezing-point. The amount of the rainfall at the surface of the ground was 1.10 inches. As the rain fell upon the trees it soon formed a coating of ice upon every exposed branch and twig, and this grew thicker and heavier until saplings were bent to the ground and large branches were broken from many trees over a wide area of country. The wind blowing gently from the north, the coating of ice was much thicker on that side of each twig or branch. Fences were decorated with long icicles hanging at a decided angle towards the south. Telegraph wires were so heavily loaded that many fell, and some of them, besides the coating of ice, had a most curious decoration in the shape of little icicles hanging about two inches apart, some of them appearing horizontal, and some (it is said) actually pointing upwards. The storm is reported as having extended over an area of some 20,000 square miles. It was not immediately followed by a thaw, which might have relieved the trees of their load; a gentle precipitation, partly of snow and partly of sleet, took place at intervals from 5 p.m. on the 8th till early in the morning of the 10th, the temperature remaining below freezing. The view on the 10th, when the clouds broke away and the sun shone on the trees, was beautiful beyond description, but the most remarkable effect was that produced by the moonlight on the evening of that day.

In order to gain something like an accurate idea of the amount of ice which had frozen on the trees, I made measurements of a number of twigs taken from the extremities of branches, in order to compare their diameter in their natural state with that they had when covered with ice. Some of the figures may be of interest. One twig .11 of an inch in diameter was enlarged to .73; another of the same size to .84; one of .12 inch diameter measured .84 with its ice-covering, and another of .12 inch measured 1.03; one of .18 diameter had become 1.21, and one of .21 had become 1.07. The largest ratio of increase which I found on a tree was in the case of a twig .09 of an inch in diameter, which had attained to .97, having gained nearly nine times its original diameter. But some upright stalks of weeds standing about eighteen inches above the ground gave still larger proportional measurements. One 5/100 of an inch in diameter now measured .87, and another of 4/100 of an inch measured .85, having increased its diameter by more than twenty times.

I made another estimate of the quantity of ice on the trees by breaking the ends of some branches from an apple-tree and weighing them with and without the ice that coated them. It appeared that wood which weighed ten ounces was carrying ice which weighed sixty-nine ounces.

Perhaps it should be noted that the ice did not freeze on the twigs or stalks so that the cross-sections would be exactly circular, and that the measurements made were those of the largest diameters in the several instances.

Prof. Brocklesby writes to the papers of a similar storm many years ago, when a piece of branch weighing four ounces carried four pounds of ice.

SAMUEL HART

Trinity College, Hartford, Conn., March 11

EDUCATION IN THE UNITED STATES¹

A SUCCESSFUL effort made to meet a strong desire that this Report should be brought out sooner enables us to call attention to it in less than twelve months after the last, but, as in material food so in the case of the many reports embodied here, thorough digestion has been essential.

¹ "United States Report of the Commissioner of Education for the Year 1881." (Washington: Government Printing Office, 1883.)